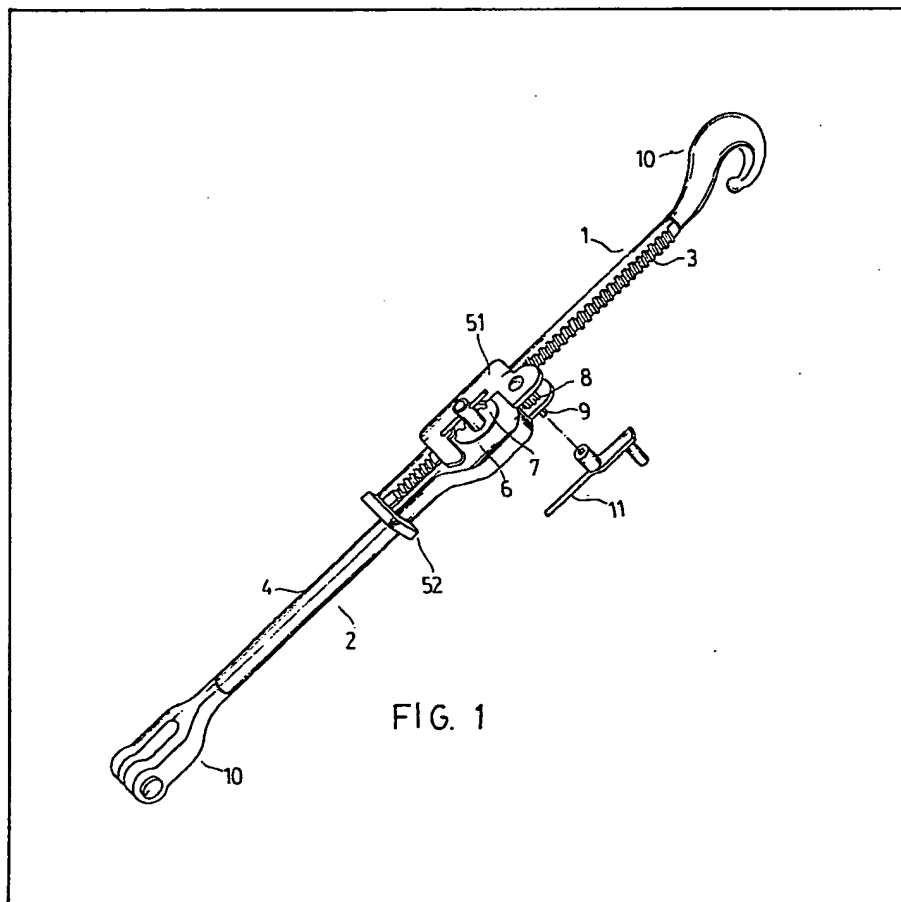


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(54) Fastening buckle

(57) A slide-type buckle for fastening and securing cargo on a deck includes a first toothed bar 1 and a second flush bar 2 which are slidably in contact with each other. Between the contact surfaces of the first and second bars 1, 2, a spring-loaded locking member 7 is disposed to prevent relative movement of the two bars after they have been set in their operative positions. The second bar 2 can be preferably provided with a pinion gear 8 matching with the toothed bar 1. The gear can be cranked to relatively move the bars and hence tighten the load using a handle 11.



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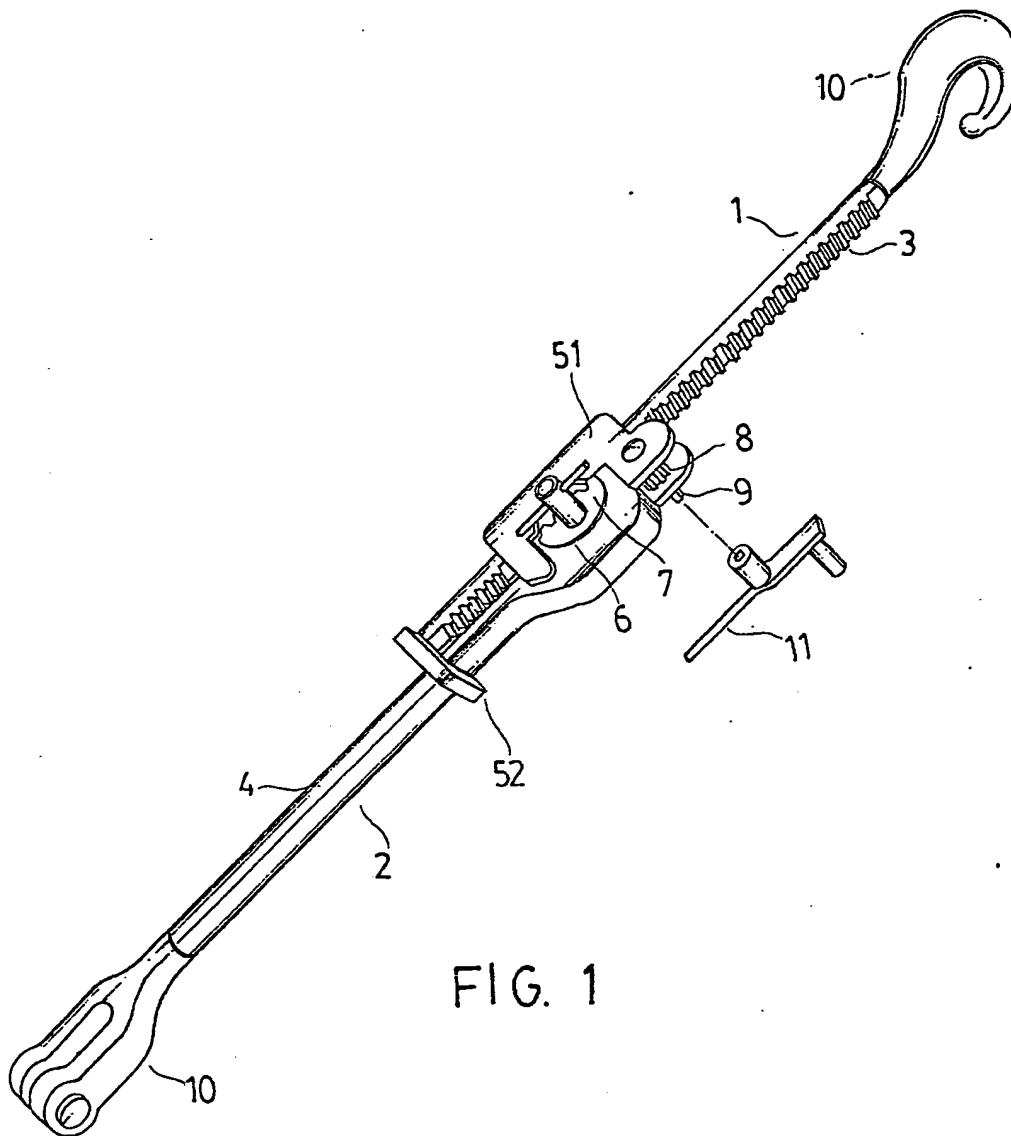


FIG. 1

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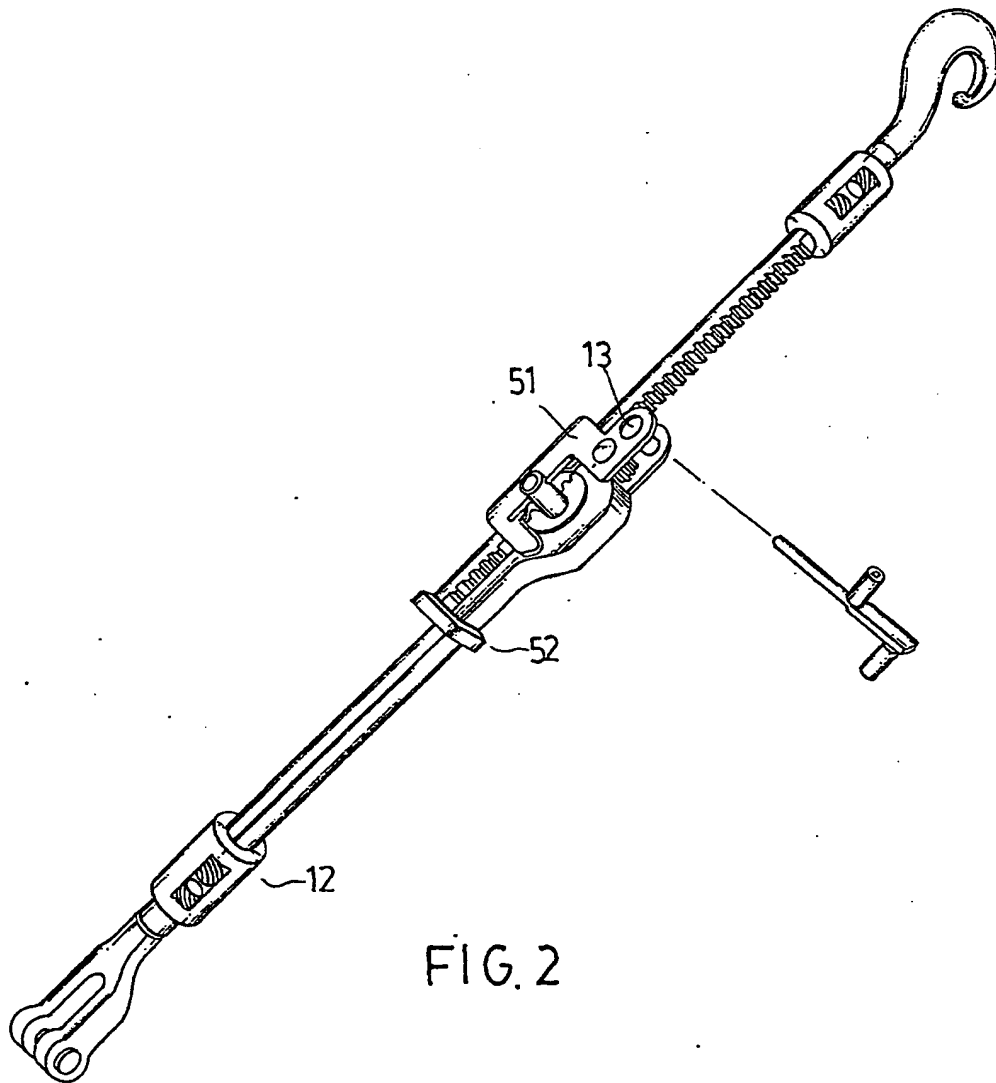


FIG. 2

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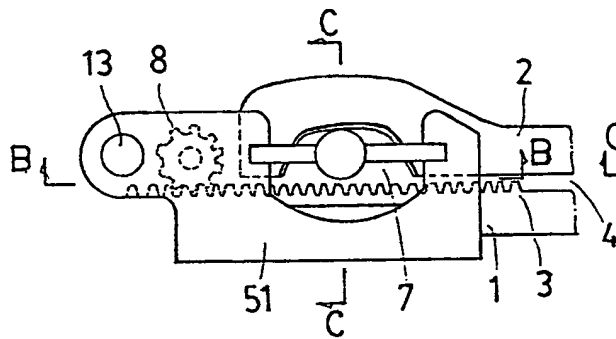


FIG. 3A

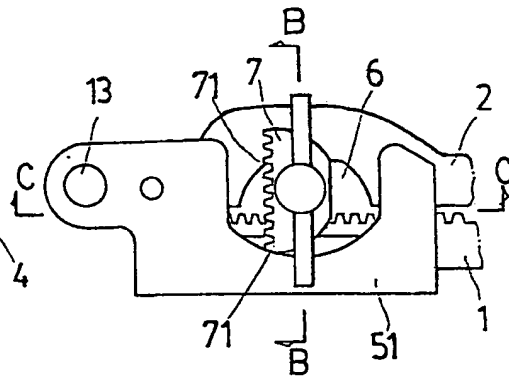


FIG. 4A

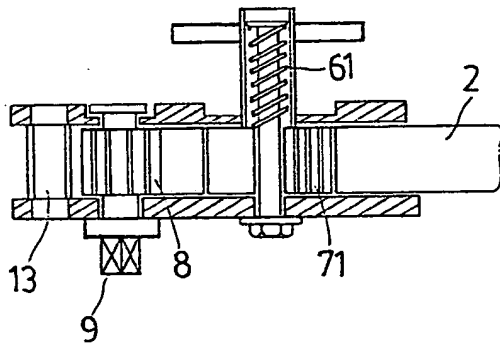


FIG. 3B

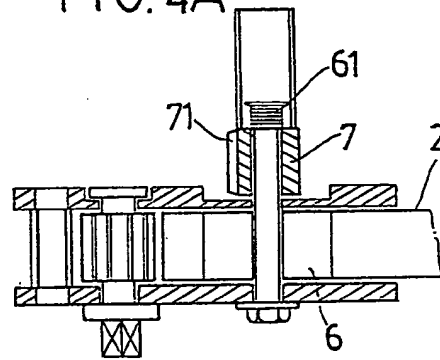


FIG. 4B

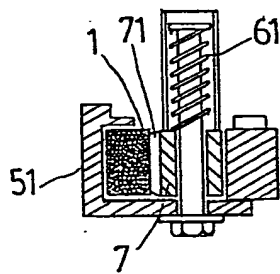


FIG. 3C

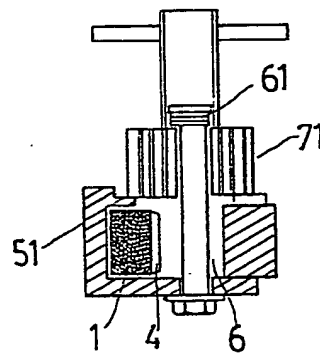


FIG. 4C

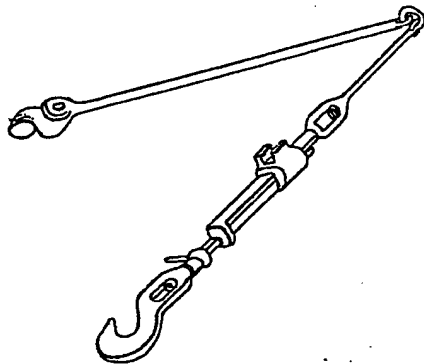


FIG. 5

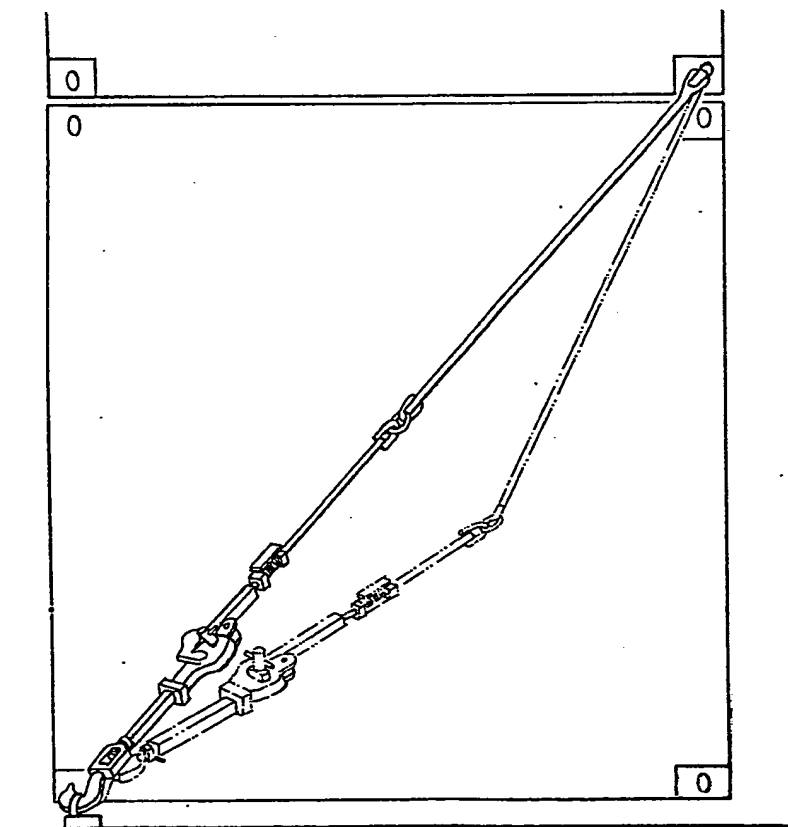
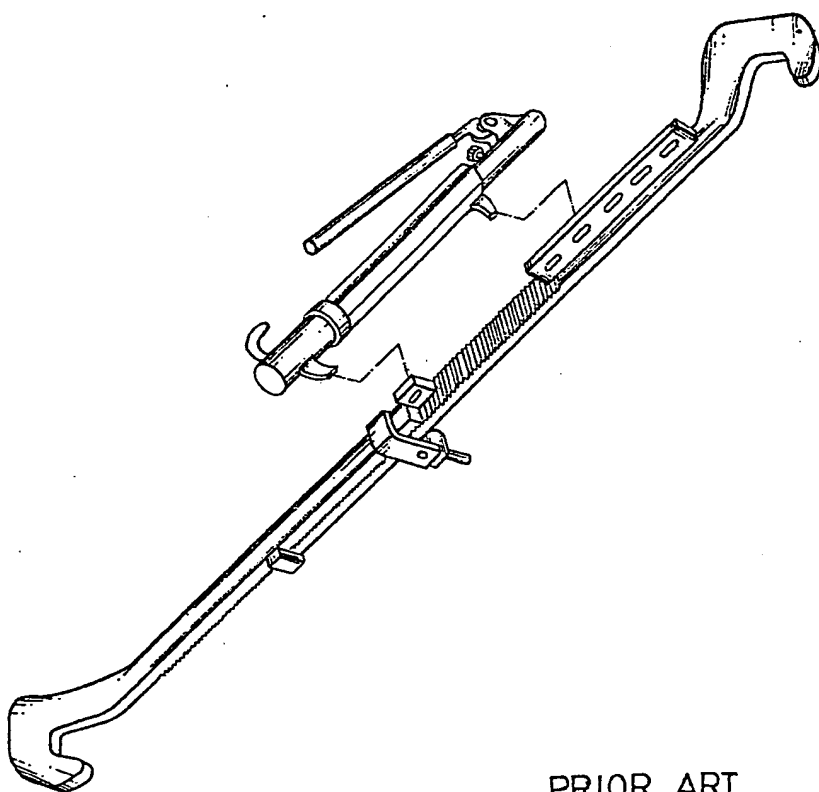


FIG. 6

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PRIOR ART

FIG. 7

## SPECIFICATION

### Fastening assembly

5 The present invention is related to a cargo fastening assembly, particularly to a fastening assembly which is effective in quick tightening and quick releasing of cargo by easy handling.

Conventionally, a fastening assembly effected by  
10 adjustment of its length for tightening an object, such as container on a deck, is a turnbuckle or so called bottlescrew. It normally includes a heavy fixed buckle with opposite internal threads at each end to couple between two pieces of rods with worm screw  
15 threads. By turning the fixed buckle, the length of the rods can be decreased or increased so as to tighten or loosen the object connected thereto respectively. However, this conventional type turn buckle needs a long time to tighten, especially needs a long and  
20 anxious time to release and reset for next use.

Meanwhile, the fixed buckle makes the part of an unnecessary extra weight of this equipment.

Fig. 7 depicts another prior tightening buckle, in which, on account of the prior art using two pieces of  
25 toothed (gear racked) bars facing each other, therefore they are unable to be slid smoothly each other due to teeth (Racks) of two bars are biting and jamming each other all the time. The stopper device for detaining two bars each other, the prior art using  
30 cam or wedge which need a heavy labor to operate and not very sure for the stopping effect after wear down. Due to no driving device on the prior art tightening buckle, accordingly it requires to use heavy hydraulic jack or pump to tighten two bars thus  
35 makes the prior art a vital defect and to be a very expensive and inconvenient equipment.

In accordance with the present invention a fastening assembly includes a first toothed bar and a second flush bar, coupled with each other and in  
40 slidable lengthwise movement relative to said first toothed bar; and a stopper member loaded with a spring and bolt inside, disposed on inner end of said second bar with a movable buckle and having a toothed segment thereof, in which said spring and  
45 bolt to engage with or disengage from said toothed bar so as to check the slidable lengthwise movement, or fix.

In accordance with one aspect of the present invention, the stopper member is floatable and  
50 rotatable relative to said second bar, and said disengagement of said toothed segment from said toothed bar is performed by up and down movement and rotation of said stopper member relative to said second bar, and being detained thereat.

55 In accordance with another aspect of the present invention, a pinion gear journaled on the inner-most end of said second bar is further provided for driving on with said first toothed bar to enable the lengthwise movement of said second bar relative to said  
60 first toothed bar.

In accordance with further aspect of the present invention, an additional buckle member fixed at an

end of said first toothed bar is further provided. The buckle member is also slidably sleeved on said  
65 second bar for keeping both toothed and flush bars in parallel condition.

In accordance with still another aspect of the present invention, a securing member such as a "C" hook, shackle, jaw or pad etc. is further provided at  
70 the free end of each of said first toothed bar and said second flush bar for holding an object cargo to be fastened.

In accordance with still further aspect of the present invention, a short piece screw may be  
75 further associated with at end of said first toothed bar and said second bar. The end at which said pinion is disposed has a hole to receive a turning rod (marline spike) for turning the buckle for fine adjustment if required.

80 It is an object of the present invention to provide a fastening assembly which can easily effect the smooth sliding operations by easy handling, and especially can achieve the releasing operation in an extremely short instant.

85 It is another object of the present invention to provide a fastening assembly which has a larger stroke available for effecting greater increase or decrease of rod's length, with a much lighter material weight due to adopting the movable small size  
90 buckle instead of fixed large size buckle. These and other objects will be apparent by illustrating preferred embodiments with reference to the following drawings, in which:

Fig. 1 is a perspective view of an embodiment  
95 according to the present invention, with condition that the stopper member fitted in position;

Fig. 2 is a perspective view of an embodiment according to the present invention, attached with short piece of screws.

100 Fig. 3A is a schematic side view of an embodiment;

Fig. 3B is a sectional view taking along line B-B of Fig. 3A;

Fig. 3C is a sectional view taking along line C-C of  
105 Fig. 3A;

Fig. 4A is a schematic side view of an embodiment illustrating the toothed bar disengaged from the toothed segment of the stopper member;

Fig. 4B is a sectional view taking along line B-B of  
110 Fig. 4A;

Fig. 4C is a sectional view taking along line C-C of Fig. 4A;

Fig. 5 is a schematic view illustrating the embodiment of the present invention coupled with a hinged  
115 lashing rod, as an example of more practical extended usage than other type;

Fig. 6 is a schematic view illustrating the embodiment of the present invention with hinged rod in Fig. 5 utilized in tightening a container on the deck or  
120 hatch cover much more swiftly and efficiently than other type; and

Fig. 7 is a prior buckle using two pieces of toothed bars facing each other.

As shown in Fig. 1, a fastening assembly, or

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referred here as a slide-type buckle is substantially formed of two bars, i.e. a first toothed bar 1 and a second bar 2. The first toothed bar 1, slidable with the second bar 2 each other, has its toothed surface 3 opposing the flush surface 4 of second bar 2. One end of the toothed bar 1 is fixed with a buckle member 51 which is sleeved on the inner end of second flush bar for restricting the latter parted from the first toothed bar 1. An auxiliary buckle 52 is sleeved on the toothed bar 2, form a hemispherical recess 6 for receiving a stopper member 7.

As better shown in Figs. 3A-3C and 4A-4C, the stopper member 7 is spring-loaded with bolt inside and has a toothed segment 71 for matching the toothed surface 3. When the slide buckle is not in operation, the toothed segment 71 is pulled in by a spring 61 to engage with the toothed surface 3 and secure both bars tightly from sliding, as shown in detail in Figs. 3A-3C. When the slide-type buckle is desired to be operated, the toothed segment 71 is to be pulled out to detach from the toothed surface 3 and followed a 90 degree rotation of said stopper member 7 relative to the second bar 1. Subsequently, the toothed segment 71 of the stopper member 7 is kept outside on top of buckle 51 and allow both bars sliding each other, as shown in detail in Figs. 4A-4C.

A pinion gear 8 with a driven shaft 9 can be preferably journaled on the buckle 51 so as to constitute with the toothed bar 1 a pinion and rack gearing. In case the toothed segment 71 is disengaged from the toothed surface 3, the rotation of the shaft driven by a crank handle 11 will drive the pinion which in turn impart a lengthwise movement and adjustment of both toothed and flush bars in double action. At the free end of each of the first and second bars 1 and 2, a securing member 10, such as hook, eye, shackle jaw or rod, etc., is preferably provided for tightening an object, such as container, lumber, vehicle etc. cargo.

In another embodiment as shown in Fig. 2, either of the first toothed bar 1 and the second bar 2 can be further associated with a conventional screw 12 to facilitate the fastening operation. In such manner, a hole 13 has to be provided for inserting a turning rod (marine spike) to execute the function of the screw part 12.

From the illustration of Figs. 5 and 6, it is easy to recognize the utilitarian advantage of the slide-type buckle used in securing the container on the deck, in which it couples with a prior hook bar through a rod, or chain.

With the invention thus explained, it is clear to one skilled in the art that many variations and modifications can be made within the spirit of the invention. Thus it is intended that the scope of the present invention be defined by the appended claims.

#### CLAIMS

1. A fastening assembly comprising:
  - a first toothed surface bar;
  - a second flush surface bar, coupled with and in slidable lengthwise movement relative to said first toothed bar; and
  - a stopper member loaded with a spring and bolt inside, disposed on said second bar and having a

toothed segment thereof, in which said toothed segment is matching with said toothed surface of the first bar and to engage or disengage to and from said toothed bar so as to allow or disallow the slidable lengthwise movement.

2. A fastening assembly according to claim 1, in which said stopper member is liftable and rotatable relative to said second bar, and said disengagement of said toothed segment from said toothed bar is performed by pulling off movement and rotation of said stopper member relative to said second bar, and being detained thereat.

3. A fastening assembly according to claims 1 or 2, further comprising a pinion gear journaled on said second bar and matching with said first toothed bar to enable the lengthwise movement by manual or mechanical force of said second bar relative to said first toothed bar, or namely, both bars sliding in and out each other.

4. A fastening assembly according to claim 3, further comprising an additional buckle member fixed at an end of said first toothed bar, and slidably sleeved on said second bar for restricting the relative sliding range of said two bars and also for keeping both bars in parallel condition always, wherein said pinion gear is disposed at an end of said second bar.

5. A fastening assembly according to claim 4, further comprising a securing member provided at the free end of each of said first toothed bar and said second flush bar.

6. A fastening assembly according to claim 5, further comprising a screw member associated with at least one of said first toothed bar and or said second bar, and said end at which said pinion is disposed, having a hole to receive a turning rod (marine spike) as auxiliary length adjustment device on screw part.

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